



EMC TEST REPORT

Report No.: SET2022-16227

Product Name: Mobile360 M500

FCC ID: 2A9K7-M360-M500

Model No. : Mobile360 M500

Applicant: VIA Intelligent Automotive, INC.

Address: 8F., NO. 525, ZHONGZHENG RD., XINDIAN DIST., NEW TAIPEI CITY 23148, TAIWAN

Received Date: 2022.11.23

Dates of Testing: 2022.11.23—2022.12.05

Issued by: CCIC Southern Testing Co., Ltd.

Electronic Testing Building, No. 43 Shahe Road, Xili Street,

Lab Location: Nanshan District, Shenzhen, Guangdong, China.

Tel: 86 755 26627338 **Fax:** 86 755 26627238

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Test Report

Product Name..... Mobile360 M500

Model No. Mobile360 M500

Trade name..... VIA

Brand Name..... VIA

Applicant..... VIA Intelligent Automotive, INC.

Applicant Address..... 8F., NO. 525, ZHONGZHENG RD., XINDIAN DIST., NEW
TAIPEI CITY 23148, TAIWAN

Manufacturer VIA Intelligent Automotive, INC.

Manufacturer Address 8F., NO. 525, ZHONGZHENG RD., XINDIAN DIST., NEW
TAIPEI CITY 23148, TAIWAN

Test Standards..... 47 CFR Part 15 Subpart B

Test Result..... PASS

Tested by Ruihong Xie

Ruihong Xie Test Engineer

2022.12.05

Reviewed by Chris You

Chris You Senior Engineer

2022.12.05

Approved by Hou Tao

Hou Tao, Manager

2022.12.05

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Change History		
Issue	Date	Reason for change
1.0	2022.12.05	First edition



1. GENERAL INFORMATION

1.1 EUT Description

EUT Name : Mobile360 M500

Trade Name.....: VIA

Brand Name.....: VIA

Hardware Version..... : RA

Software Version..... : N/A

*Note1:*The EUT is a Mobile360 M500;

*Note2 :*For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.



1.2 Test Standards and Results

The objective of the report is to perform testing according to 47 CFR Part 15 Subpart B:

No.	Identity	Document Title
1	47 CFR Part 15 Subpart B	Radio Frequency Devices

Test detailed items/section required by FCC rules and results are as below:

No.	Section	Description	Result
1	15.107	Conducted Emission	N/A
2	15.109	Radiated Emission	PASS

NOTE:

- (1) The EUT has been tested according to 47 CFR Part 15 Subpart B, Class B. The test procedure is according to ANSI C63.4:2014.



Facilities and Accreditations

1.2.1 Facilities

FCC-Registration No.: CN1283

CCIC Southern Testing Co., Ltd EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. Designation Number: CN1283, valid time is until April 19th, 2023.

ISED Registration: 11185A-1

CCIC Southern Testing Co., Ltd. EMC Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 11185A-1 on Aug. 04, 2016, valid time is until April 20th, 2023.

A2LA Code: 5721.01

CCIC-SET is a third party testing organization accredited by A2LA according to ISO/IEC 17025. The accreditation certificate number is 5721.01.

1.2.2 Test Environment Conditions

During the measurement, the environmental conditions were within the listed ranges:

Temperature (°C):	15 °C - 35 °C
Relative Humidity (%):	25% -75%
Atmospheric Pressure (kPa):	86kPa-106kPa

1.2.3 Measurement Uncertainty

The uncertainty is calculated using the methods suggested in the "Guide to the Expression of Uncertainty in Measurement" (GUM) published by ISO.

Uncertainty of Conducted Emission:	Uc = 3.2 dB (k=2)
Uncertainty of Radiated Emission: (30MHz~1GHz)	Uc = 5.8 dB (k=2)
Uncertainty of Radiated Emission: (1~6GHz)	Uc = 5.1 dB (k=2)
Uncertainty of Radiated Emission: (6~18GHz)	Uc = 5.5 dB (k=2)

2. TEST CONDITIONS SETTING

2.1 Test Peripherals

The following is a listing of the EUT and peripherals utilized during the performance of EMC test:

Support Equipment:

Description	Brand name	Model	Serial No.	FCCID
/	/	/	/	/

Support Cable:

Description	Shield Type	Ferrite Core	Length
DC Power Cable	Un- shielding	No	1.2m

2.2 Test Mode

The EUT have the following typical setups during the test:

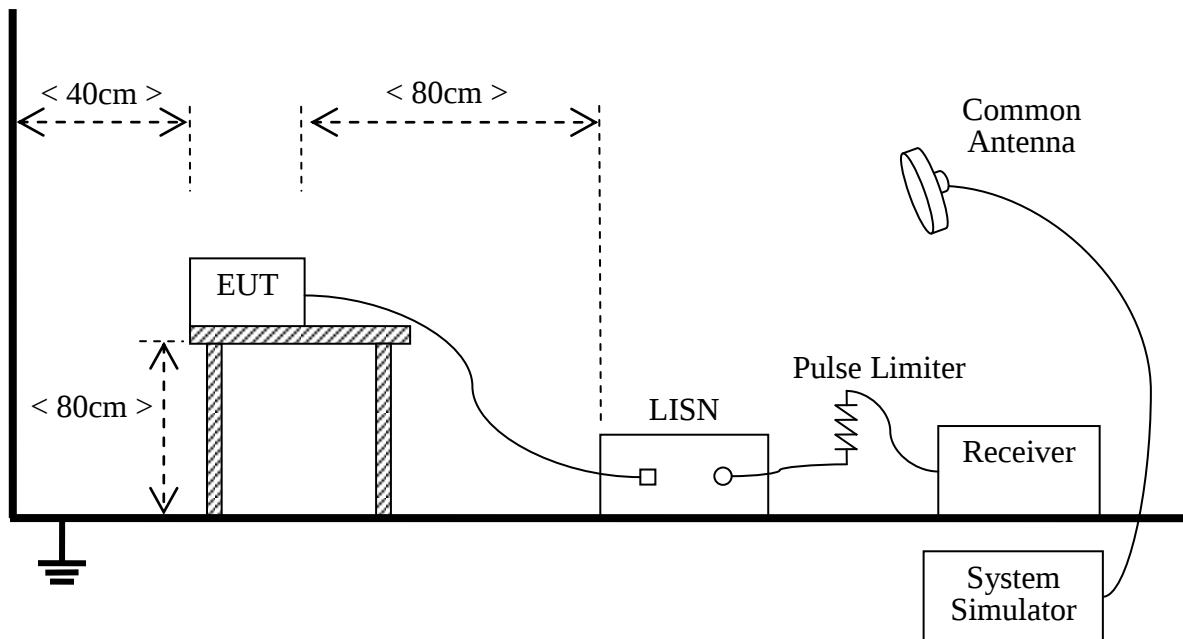
Setup1: EUT + Speaker + Display + Camera(DSS+PLF+R);

Setup2: EUT + Speaker + Display + Camera(PLF+PR+R);

2.3 Test Setup and Equipments List

2.3.1 Conducted Emission

A. Test Setup:



The EUT is placed on a 0.8m high insulating table, which stands on the grounded conducting floor, and keeps 0.4m away from the grounded conducting wall. The EUT is connected to the power mains through a LISN which provides $50\Omega/50\mu\text{H}$ of coupling impedance for the measuring instrument. The Common Antenna is used for the call between the EUT and the System Simulator (SS). A Pulse Limiter is used to protect the measuring instrument. The factors of the whole test system are calibrated to correct the reading.

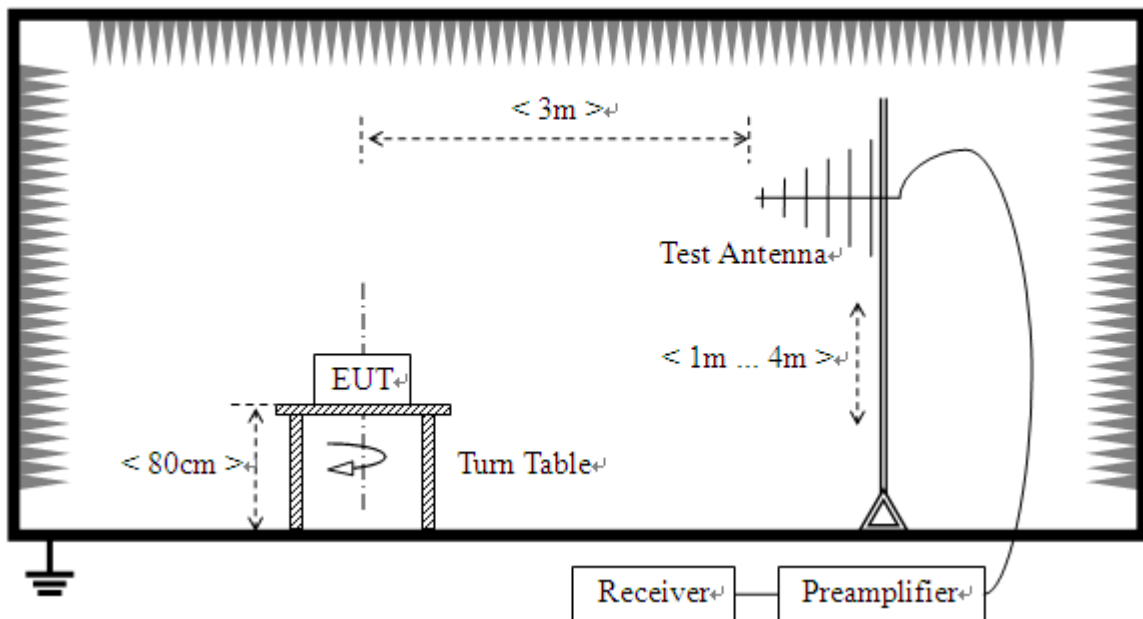
B. Equipments List:

Description	Manufacturer	Model	Serial No.	Calibration Date	Calibration Due. Date
Test Receiver	KEYSIGHT	N9038A	A141202036	2022.07.21	2023.07.20
LISN	ROHDE&SCHWARZ	ENV216	A140701847	2022.07.21	2023.07.20
Cable	MATCHING PAD	W7	/	2022.08.02	2023.08.02

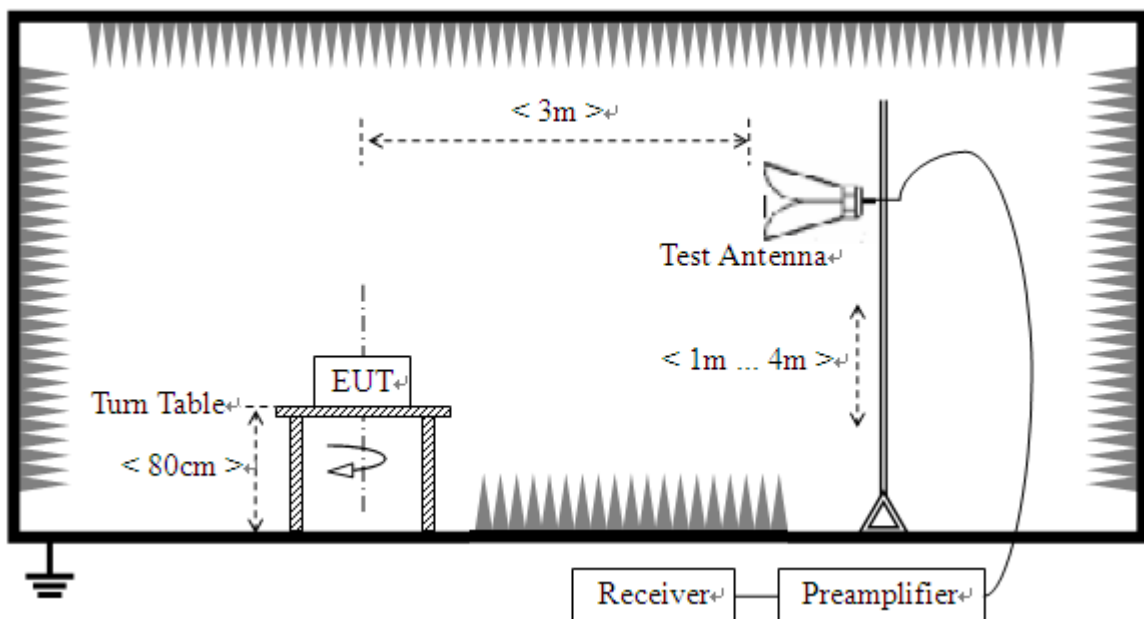
2.3.2 Radiated Emission

A. Test Setup:

- 1) For radiated emissions from 30MHz to 1GHz



- 2) For radiated emissions above 1GHz



**B. Test Procedure**

The test is performed in a 3m Semi-Anechoic Chamber; the antenna factor, cable loss and so on of the site (factors) is calculated to correct the reading. The EUT is placed on a 0.8m high insulating Turn Table, and keeps 3m away from the Test Antenna, which is mounted on a variable-height antenna master tower.

For the test Antenna:

- 1) In the frequency range above 30MHz, Bi-Log Test Antenna (30MHz to 1GHz) and Horn Test Antenna (above 1GHz) are used. Test Antenna is 3m away from the EUT. Test Antenna height is varied from 1m to 4m above the ground to determine the maximum value of the field strength. The emission levels at both horizontal and vertical polarizations should be tested.

C. Equipments List:

Description	Manufacturer	Model	Serial No.	Calibration Date	Calibration Due. Date
EMI Test Receiver	ROHDE&SCHWARZ	ESCI	A0902601	2022.05.23	2023.04.17
Broadband Ant.	2786	ETC	A150402239	2021.09.16	2024.03.03
3M Anechoic Chamber	Albatross	SAC-3MAC 9*6*6m	A0412375	2019.03.26	2023.03.25
EMI Test Receiver	ROHDE&SCHWARZ	ESW26	A180502935	2022.07.21	2023.07.20
5M Anechoic Chamber	Albatross	SAC-5MAC 12.8x6.8x6.4m	A0304210	2022.03.25	2023.03.24
EMI Horn Ant.	ROHDE&SCHWARZ	HF906	A0304225	2019.03.25	2023.03.24

3. 47 CFR PART 15B REQUIREMENTS

3.1 Conducted Emission

3.1.1 Requirement

According to FCC section 15.107, the radio frequency voltage that is conducted back onto the AC power line on any frequency within the band 150kHz to 30MHz shall not exceed the limits in the following table, as measured using a 50 μ H/50 Ω line impedance stabilization network (LISN).

Frequency range (MHz)	Conducted Limit (dB μ V)	
	Quasi-peak	Average
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5	56	46
5 - 30	60	50

Note:

- a) The limit subjects to the Class B digital device.
- b) The lower limit shall apply at the band edges.
- c) The limit decreases linearly with the logarithm of the frequency in the range 0.15 - 0.50MHz.

3.1.2 Test Description

See section 2.3.1 of this report.

3.1.3 Test Result

Not applicable for this DC Power supply device

3.2 Radiated Emission

3.2.1 Requirement

According to FCC section 15.109, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency range (MHz)	Field Strength		Field Strength Limitation at 3m Measurement Dist	
	$\mu\text{V/m}$	Dist	($\mu\text{V/m}$)	(dBuV/m)
30.0 - 88.0	100	3m	100	$20\log 100$
88.0 - 216.0	150	3m	150	$20\log 150$
216.0 - 960.0	200	3m	200	$20\log 200$
Above 960.0	500	3m	500	$20\log 500$

- For frequencies above 1000MHz, the field strength limits are based on average detector. When average radiated emission measurements are specified in this part, including emission measurements below 1000MHz, there also is a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit for the frequency being investigated unless a different peak emission limit is otherwise specified in the rules.
- Test Antenna is 3m away from the EUT. Test Antenna height is varied from 1m to 4m above the ground to determine the maximum value of the field strength.
- For below 1G :QP detector RBW 120kHz ,VBW 300kHz.

For Above 1G: PK detector RBW 1MHz,VBW 3MHz for PK value ;AV detector RBW 1MHz, VBW 10Hz for AV value.

Note:

- The tighter limit shall apply at the boundary between two frequency range.
- Limitation expressed in dBuV/m is calculated by $20\log \text{Emission Level}(\mu\text{V/m})$.
- If measurement is made at 3m distance, then F.S Limitation at 3m distance is adjusted by using the formula of $L_{d1} = L_{d2} * (d_2/d_1)^2$.

Example:

F.S Limit at 30m distance is $30\mu\text{V/m}$, then F.S Limitation at 3m distance is adjusted as

$$L_{d1} = L_1 = 30\mu\text{V/m} * (10)^2 = 100 * 30\mu\text{V/m}.$$

3.2.2 Test Description

See section 2.3.2 of this report.

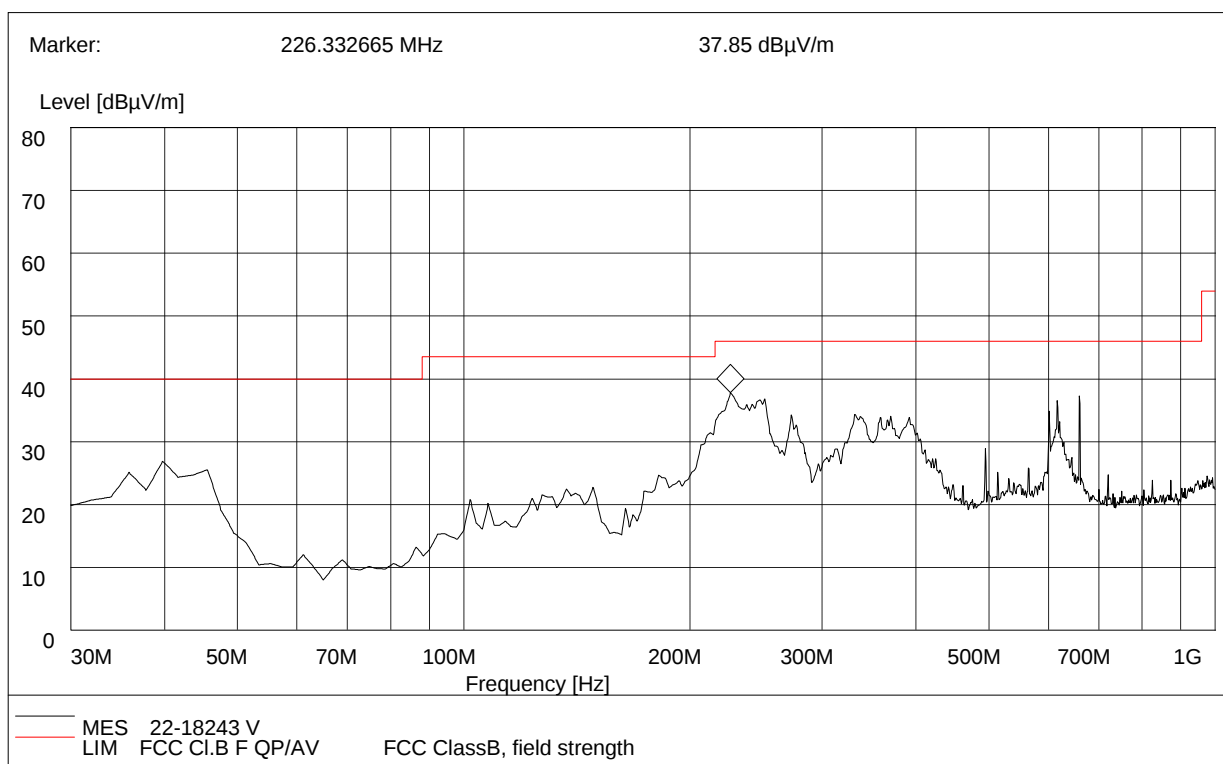
3.2.3 Test Result

The maximum radiated emission is searched using PK, QP and AV detectors; the emission levels more than the limits, and that have narrow margins from the limits will be re-measured with AV and QP detectors. Both the vertical and the horizontal polarizations of the Test Antenna are considered to perform the tests. All test modes are considered, refer to recorded points and plots below.

The amplitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be reported.

Note: All radiated emission tests were performed in X, Y, Z axis direction, and only the worst axis test condition was recorded in this test report.

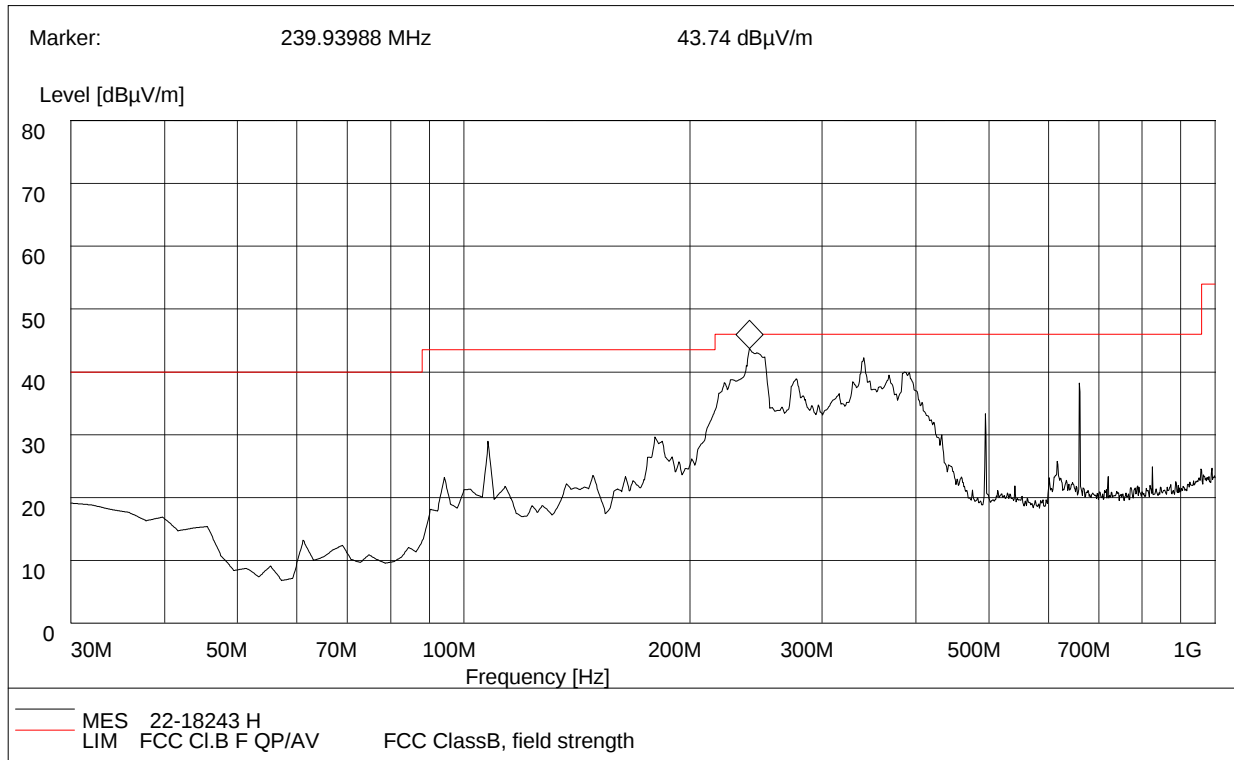
A.Radiation disturbances, antenna polarization: Vertical, Setup2, 24V DC



(Plot C: Test Antenna Vertical 30M - 1G)

Frequency (MHz)	QuasiPeak (dB μ V/m)	Bandwidth (kHz)	Antenna height (cm)	Limit (dB μ V/m)	Margin (dB)	Antenna	Cable Loss(dB)	ANT. Factor(dB)	Verdict
39.29	25.63	120.000	132	40.00	14.37	Vertical	0.5	13.5	Pass
45.37	24.71	120.000	119	40.00	15.29	Vertical	0.5	10.7	Pass
148.22	22.00	120.000	127	43.50	21.50	Vertical	1.0	11.4	Pass
181.06	24.62	120.000	104	43.50	18.88	Vertical	1.2	9.8	Pass
226.19	36.44	120.000	118	46.00	9.56	Vertical	1.2	10.7	Pass
659.20	37.17	120.000	105	46.00	8.83	Vertical	1.7	20.1	Pass

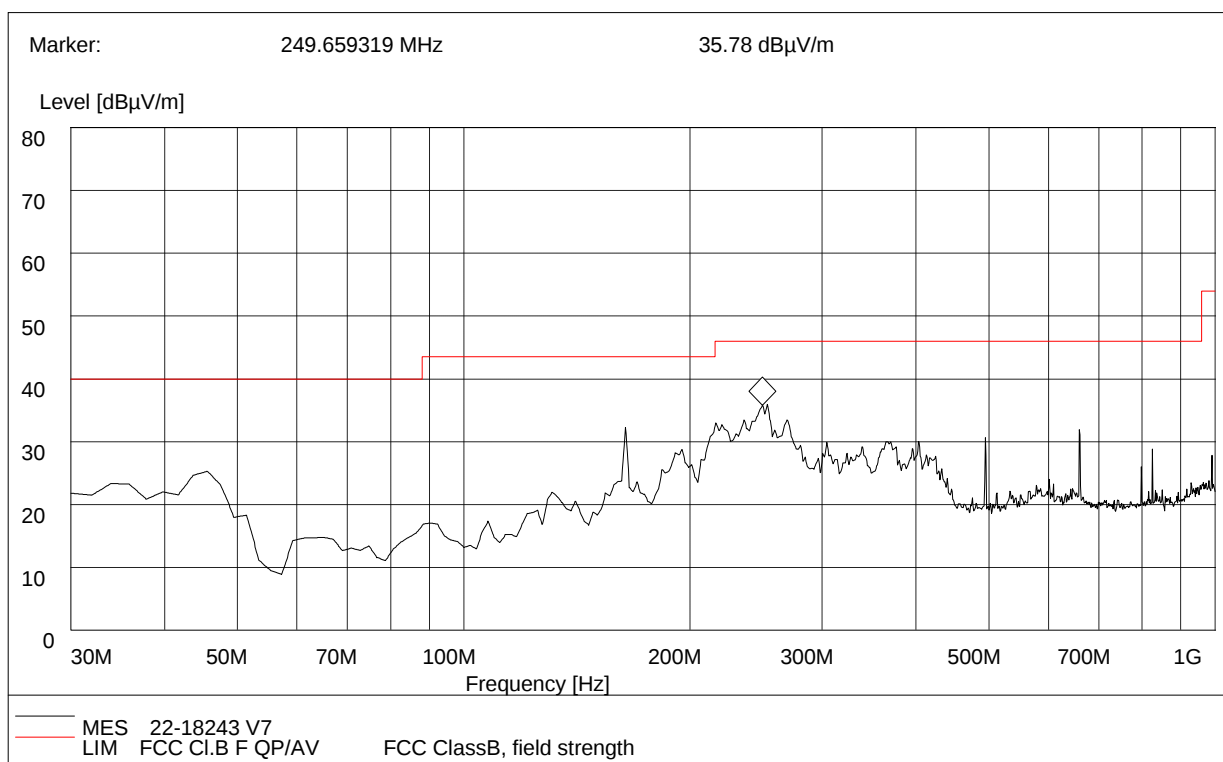
B.Radiation disturbances, antenna polarization: Horizontal, Setup1, 24V DC



(Plot D: Test Antenna Horizontal 30M - 1G)

Frequency (MHz)	QuasiPeak (dB μ V/m)	Bandwidth (kHz)	Antenna height (cm)	Limit (dB μ V/m)	Margin (dB)	Antenna	Cable Loss(dB)	ANT. Factor(dB)	Verdict
30.00	18.51	120.000	121	40.00	21.49	Vertical	0.5	18.8	Pass
61.09	12.13	120.000	109	40.00	27.87	Vertical	0.8	5.3	Pass
107.47	22.07	120.000	114	43.50	21.43	Vertical	1.0	10.9	Pass
179.62	28.65	120.000	135	43.50	14.85	Vertical	1.2	11.0	Pass
239.39	42.68	120.000	100	46.00	3.32	Vertical	1.2	11.8	Pass
341.48	41.00	120.000	107	46.00	5.00	Vertical	1.4	16.1	Pass

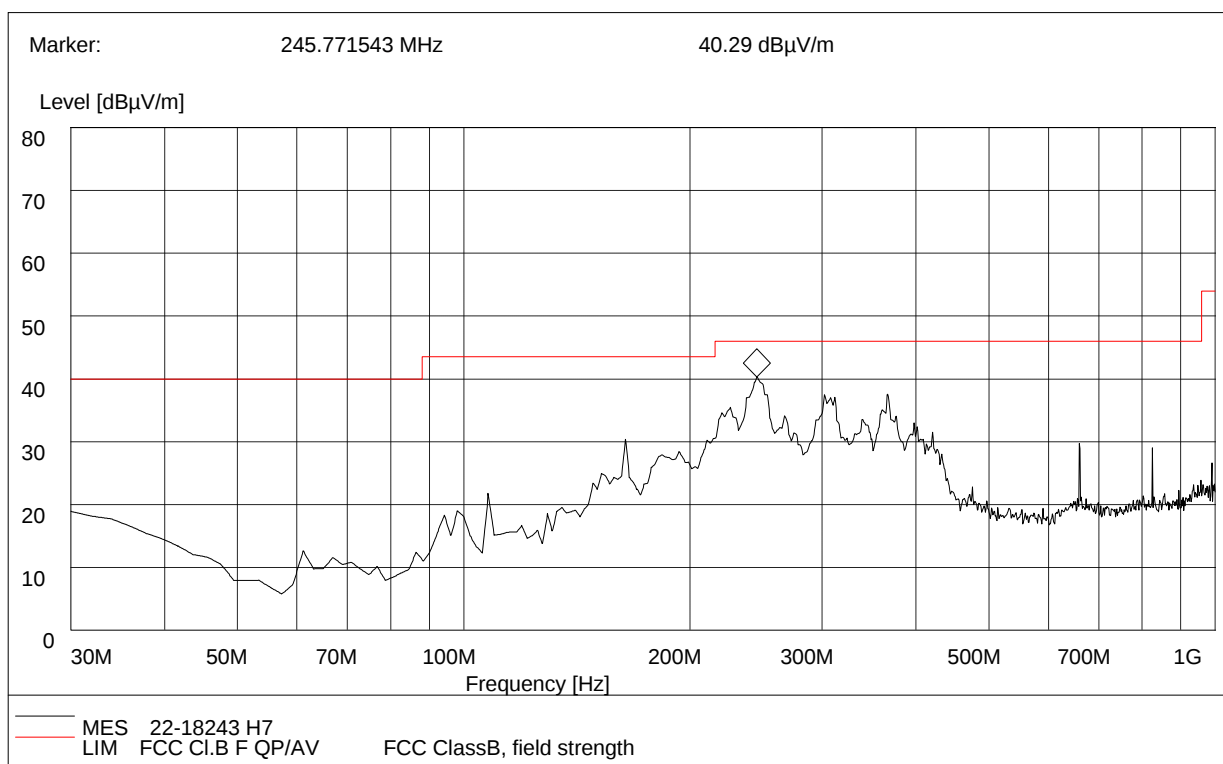
C.Radiation disturbances, antenna polarization:Vertical,Setup2,24V DC



(Plot C: Test Antenna Vertical 30M - 1G)

Frequency (MHz)	QuasiPeak (dB μ V/m)	Bandwidth (kHz)	Antenna height (cm)	Limit (dB μ V/m)	Margin (dB)	Antenna	Cable Loss(dB)	ANT. Factor(dB)	Verdict
34.36	23.52	120.000	120	40.00	16.48	Vertical	0.5	17.1	Pass
45.53	24.47	120.000	119	40.00	15.53	Vertical	0.5	10.7	Pass
164.14	32.01	120.000	100	43.50	11.49	Vertical	1.2	11.3	Pass
195.27	27.63	120.000	104	43.50	15.87	Vertical	1.2	8.8	Pass
249.30	35.24	120.000	107	46.00	10.76	Vertical	1.2	11.9	Pass
674.23	31.51	120.000	110	46.00	10.49	Vertical	1.2	20.1	Pass

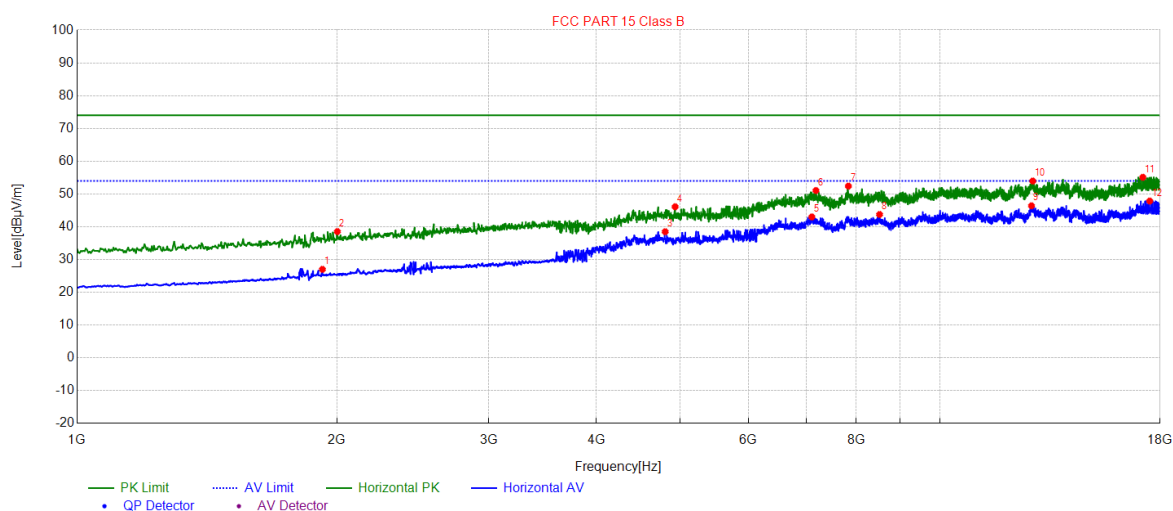
D.Radiation disturbances, antenna polarization: Horizontal,Setup2,24V DC



(Plot D: Test Antenna Horizontal 30M - 1G)

Frequency (MHz)	QuasiPeak (dB μ V/m)	Bandwidth (kHz)	Antenna height (cm)	Limit (dB μ V/m)	Margin (dB)	Antenna	Cable Loss(dB)	ANT. Factor(dB)	Verdict
30.00	18.61	120.000	113	40.00	21.39	Vertical	0.5	18.8	Pass
61.36	12.02	120.000	121	40.00	27.98	Vertical	0.8	5.3	Pass
106.20	21.05	120.000	107	43.50	22.45	Vertical	0.8	10.2	Pass
164.19	30.27	120.000	114	43.50	13.23	Vertical	1.2	11.1	Pass
245.83	40.29	120.000	120	46.00	5.71	Vertical	1.2	11.1	Pass
301.62	37.65	120.000	137	46.00	8.35	Vertical	1.4	14.3	Pass

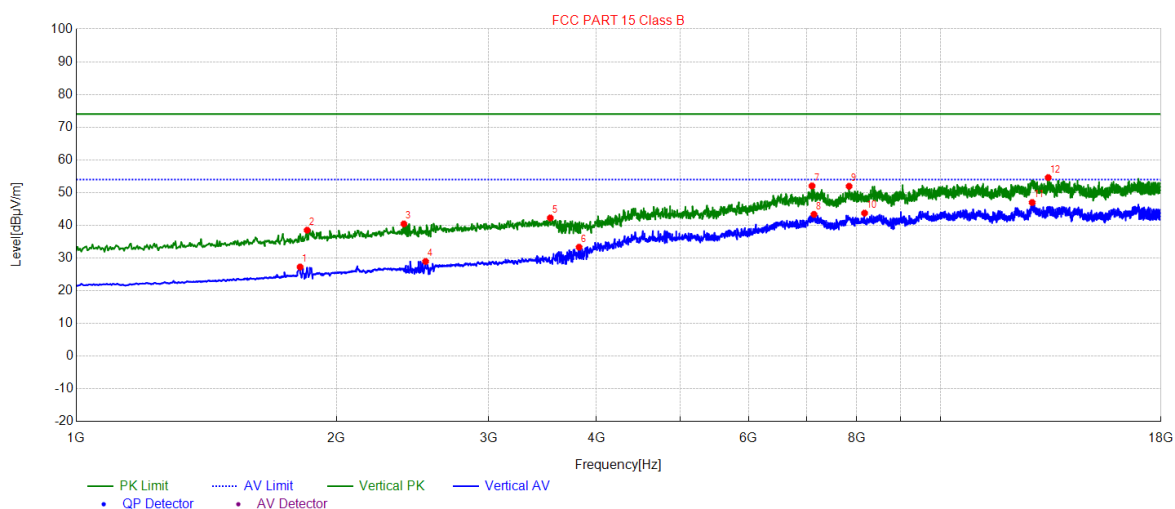
A.Radiation disturbances, antenna polarization: Horizontal ,Setup1



(Plot M: Test Antenna Horizontal 1G – 18G)

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin[dB μV/m]	Trace	Height [cm]	Angle [°]	Polarity
1	1924.81	27.02	-12.19	54.00	26.98	AV	119	273	Horizontal
2	2003.00	38.52	-11.87	74.00	35.48	PK	107	145	Horizontal
3	4804.61	38.48	-0.86	54.00	15.52	AV	124	112	Horizontal
4	4933.85	46.11	-1.48	74.00	27.89	PK	115	313	Horizontal
5	7106.42	43.00	3.43	54.00	11.00	AV	132	334	Horizontal
6	7184.67	51.05	3.47	74.00	22.95	PK	121	245	Horizontal
7	7834.34	52.40	4.00	74.00	21.60	PK	104	330	Horizontal
8	8514.55	43.75	4.49	54.00	10.25	AV	116	279	Horizontal
9	12770.8	46.40	7.63	54.00	7.60	AV	130	144	Horizontal
10	12815.4	53.95	7.74	74.00	20.05	PK	155	42	Horizontal
11	17190.8	55.09	11.93	74.00	18.91	PK	102	209	Horizontal
12	17510.4	47.85	12.42	54.00	6.15	AV	111	355	Horizontal

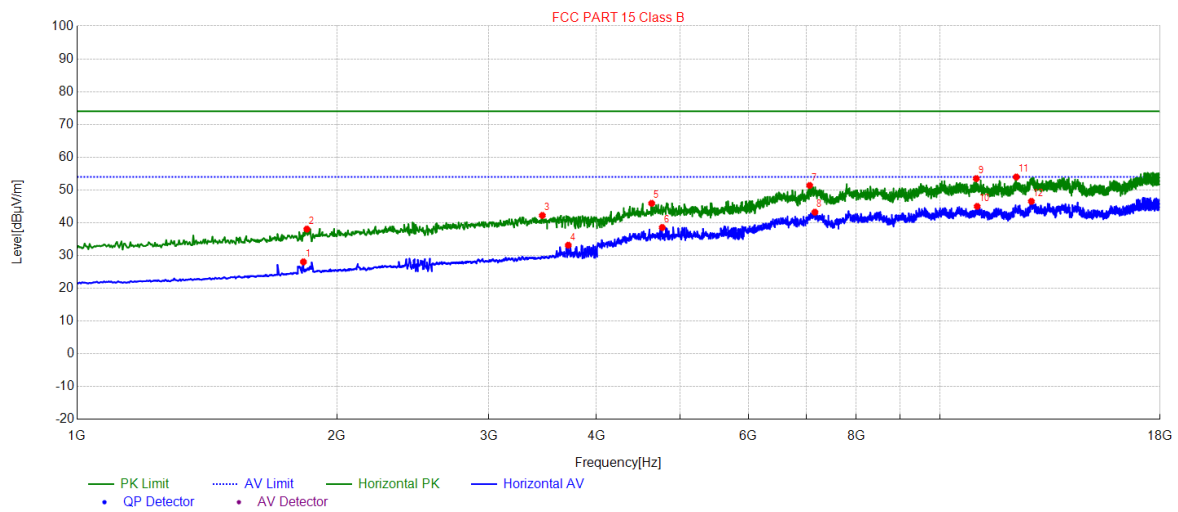
B.Radiation disturbances, antenna polarization: Vertical,Setup1



(Plot N: Test Antenna Vertical 1G – 18G)

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin[dB μV/m]	Trace	Height [cm]	Angle [°]	Polarity
1	1816.02	27.26	-12.67	54.00	26.74	AV	125	291	Vertical
2	1850.17	38.52	-12.51	74.00	35.48	PK	134	304	Vertical
3	2394.33	40.43	-10.67	74.00	33.57	PK	116	95	Vertical
4	2536.80	28.96	-10.14	54.00	25.04	AV	139	28	Vertical
5	3536.45	42.26	-7.10	74.00	31.74	PK	100	265	Vertical
6	3818.69	33.32	-5.87	54.00	20.68	AV	104	332	Vertical
7	7103.17	52.04	3.43	74.00	21.96	PK	115	180	Vertical
8	7140.45	43.34	3.45	54.00	10.66	AV	127	54	Vertical
9	7840.80	51.94	4.01	74.00	22.06	PK	122	166	Vertical
10	8170.60	43.74	4.25	54.00	10.26	AV	109	62	Vertical
11	12770.8	46.97	7.63	54.00	7.03	AV	124	81	Vertical
12	13328.4	54.58	8.12	74.00	19.42	PK	113	119	Vertical

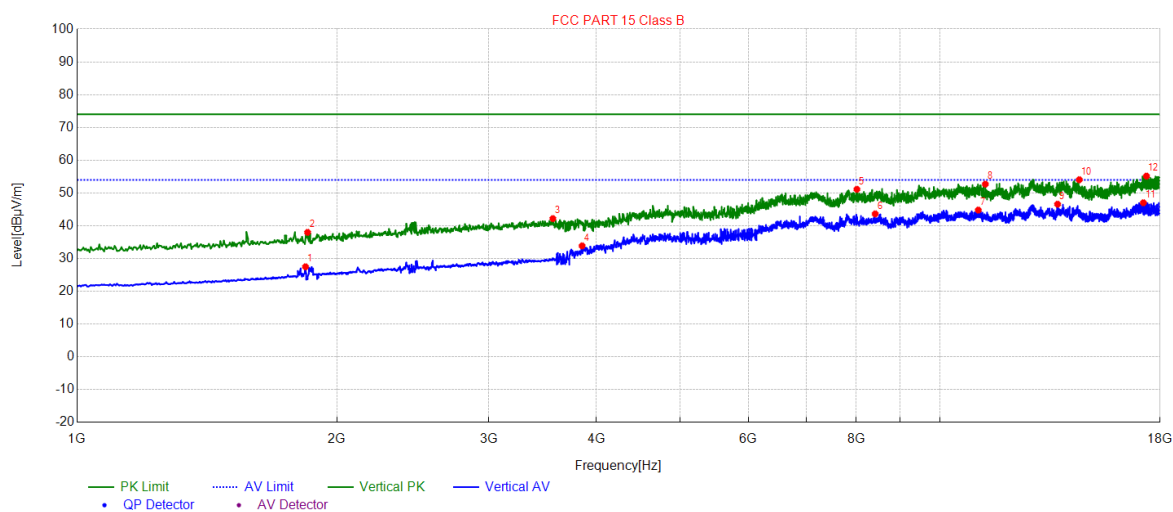
A.Radiation disturbances, antenna polarization: Horizontal ,Setup2



(Plot M: Test Antenna Horizontal 1G – 18G)

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin[dB μV/m]	Trace	Height [cm]	Angle [°]	Polarity
1	1829.50	28.07	-12.60	54.00	25.93	AV	134	162	Horizontal
2	1846.24	38.07	-12.53	74.00	35.93	PK	155	331	Horizontal
3	3461.19	42.24	-7.36	74.00	31.76	PK	127	45	Horizontal
4	3709.37	33.16	-6.24	54.00	20.84	AV	132	47	Horizontal
5	4634.09	45.92	-1.37	74.00	28.08	PK	107	80	Horizontal
6	4767.21	38.56	-0.92	54.00	15.44	AV	127	153	Horizontal
7	7065.50	51.38	3.40	74.00	22.62	PK	119	252	Horizontal
8	7164.34	43.22	3.47	54.00	10.78	AV	134	116	Horizontal
9	11023.18	53.47	6.64	74.00	20.53	PK	158	164	Horizontal
10	11047.00	45.00	6.61	54.00	9.00	AV	136	317	Horizontal
11	12264.21	53.95	6.71	74.00	20.05	PK	122	71	Horizontal
12	12767.40	46.53	7.62	54.00	7.47	AV	119	63	Horizontal

B.Radiation disturbances, antenna polarization: Vertical,Setup2



(Plot N: Test Antenna Vertical 1G – 18G)

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin[dB μV/m]	Trace	Height [cm]	Angle [°]	Polarity
1	1839.83	27.48	-12.55	54.00	26.52	AV	129	141	Vertical
2	1850.49	37.98	-12.51	74.00	36.02	PK	112	207	Vertical
3	3560.30	42.18	-6.97	74.00	31.82	PK	107	224	Vertical
4	3849.07	33.86	-5.71	54.00	20.14	AV	116	235	Vertical
5	8014.14	51.11	4.07	74.00	22.89	PK	123	310	Vertical
6	8415.23	43.62	4.49	54.00	10.38	AV	114	192	Vertical
7	11081.0	44.78	6.58	54.00	9.22	AV	130	211	Vertical
8	11291.8	52.69	6.39	74.00	21.31	PK	129	349	Vertical
9	13692.2	46.57	8.71	54.00	7.43	AV	136	293	Vertical
10	14508.3	54.04	9.60	74.00	19.96	PK	125	27	Vertical
11	17214.6	47.01	11.95	54.00	6.99	AV	118	144	Vertical
12	17357.4	55.14	12.24	74.00	18.86	PK	126	123	Vertical

-----End of Report-----